

**Publications/Presentations
Fiscal Year 2003**

Environmental Research Division

1. Refereed Publications

Allison, V.J., "Nutrients, Arbuscular Mycorrhizas, and Competition Interact to Influence Seed Production and Germination Success in *Achillea millefolium*," *Functional Ecology* 16:742-749 (2002).

Allison, V.J., and Goldberg, D.E., "Species-Level versus Community-Level Patterns of Mycorrhizal Dependence on Phosphorus: An Example of Simpson's Paradox," *Functional Ecology* 16:346-352 (2002).

Balsley, B., Fritts, D., Frehlich, R., Jones, M., Vadas, S., and Coulter, R., "Up-Gully Flow in the Great Plains Region: A Mechanism for Perturbing the Nighttime Lower Atmosphere?" *Geophysical Research Letters* 29(19):1931 (2002).

Bedzyk, M.J., and Cheng, L., "X-ray Standing Wave Studies of Minerals and Mineral Surfaces: Principles and Applications," pp. 221-266 in *Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science*, edited by P. Fenter, M. Rivers, N.C. Sturchio, and S. Sutton (Reviews in Mineralogy and Geochemistry, volume 49), Geochemical Society and Mineralogical Society of America, Washington, D.C. (2002).

Boyanov, M.I., Kelly, S.D., Kemner, K.M., Bunker, B.A., Fein, J.B., and Fowle, D.A., "Adsorption of Cadmium to *Bacillus subtilis* Bacterial Cell Walls: A pH-Dependent X-ray Absorption Fine Structure Spectroscopy Study," *Geochimica et Cosmochimica Acta* 67(18):3299-3311 (2003).

Boyanov, M.I., Kmetko, J., Shibata, T., Datta, A., Dutta, P., and Bunker, B.A., "Mechanism of Pb Adsorption to Fatty Acid Langmuir Monolayers Studied by X-ray Absorption Fine Structure Spectroscopy," *Journal of Physical Chemistry B* 107:9780-9788 (2003).

Braun, J., Rocken, C., and Liljegren, J.C., "Comparisons of Line-of-Sight Water Vapor Observations Using the Global Positioning System and a Pointing Microwave Radiometer," *Journal of Atmospheric and Oceanic Technology* 20:606-612 (2003).

Brooks, S.C., Fredrickson, J.K., Carroll, S.L., Kennedy, D.W., Zachara, J.M., Plymale, A.E., Kelly, S.D., Kemner, K.M., and Fendorf, S., "Inhibition of Bacterial U(VI) Reduction by Calcium," *Environmental Science and Technology* 37(9):1850-1858 (2003).

Carpenter, E.E., Cestone, V., Landry, G., Harris, V.G., and Kemner, K.M., "Synthesis of Amorphous Lepidocrocite Thin Films via Spin-Spray Ferrite Plating," *Chemistry of Materials* 15:1235-1236 (2003).

Cheng, L., Fenter, P., Bedzyk, M.J., and Sturchio, N.C., "Fourier-Expansion Solution of Atom Distributions in a Crystal Using X-ray Standing Waves," *Physical Review Letters* 90(25):255503(1-4) (2003).

Das, M., Kang, D., Aneja, V.P., Lonneman, W., Cook, D.R., and Wesely, M.L., "Measurements of Hydrocarbon Air-Surface Exchange Rates over Maize," *Atmospheric Environment* 37:2269-2277 (2003).

Doran, J.C., Berkowitz, C.M., Coulter, R.L., Shaw, W.J., and Spicer, C.W., "The 2001 Phoenix Sunrise Experiment: Vertical Mixing and Chemistry during the Morning Transition in Phoenix," *Atmospheric Environment* 37:2365-2377 (2003).

Fenter, P., "X-ray Reflectivity as a Probe of Mineral-Fluid Interfaces: A User Guide," pp. 149-220 in *Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science*, edited by P. Fenter, M. Rivers, N.C. Sturchio, and S. Sutton (Reviews in Mineralogy and Geochemistry, volume 49), Geochemical Society and Mineralogical Society of America, Washington, D.C. (2002).

Fenter, P., Park, C., Cheng, L., Zhang, Z., Krekeler, M.P.S., and Sturchio, N.C., "Orthoclase Dissolution Kinetics Probed by *In Situ* X-ray Reflectivity: Effects of Temperature, pH, and Crystal Orientation," *Geochimica et Cosmochimica Acta* 67(2):197-211 (2003).

Fryxell, G.E., Lin, Y., Wu, H., and Kemner, K.M., "Environmental Applications of Self-Assembled Monolayers on Mesoporous Supports (SAMMS)," pp. 583-590 in *Studies in Surface Science and Catalysis*, vol. 141, edited by A. Sayari and M. Jaroniec, Elsevier Science, Amsterdam (2002).

Gaffney, J.S., "Marvin L. Wesely, 1944-2003," *Bulletin of the American Meteorological Society* 84(6):812-814 (2003).

Gaffney, J.S., and Marley, N.A., "Atmospheric Chemistry and Air Pollution," *The Scientific World* 3(4):199-234, online at <http://www.thescientificworld.com> (2003).

Gaffney, J.S., Marley, N.A., and Frederick, J.E., "Formation and Effects of Smog," 6.13.2.8 in *Encyclopedia of Life Support Systems, Atmospheric Chemistry*, edited by Aleksandar Sabljic, developed under the auspices of United Nations Educational, Cultural and Scientific Organization, EOLSS Publishers, Oxford, United Kingdom, <http://www.eolss.net> (2002).

Kelly, S.D., Kemner, K.M., Fein, J.B., Fowle, D.A., Boyanov, M.I., Bunker, B.A., and Yee, N., "X-ray Absorption Fine Structure Determination of pH-Dependent U-Bacterial Cell Wall Interactions," *Geochimica et Cosmochimica Acta* 66(22):3855-3871 (2002).

Kelly, S.D., Newville, M.G., Cheng, L., Kemner, K.M., Sutton, S.R., Fenter, P., Sturchio, N.C., and Spotl, C., "Uranyl Incorporation in Natural Calcite," *Environmental Science and Technology* 37:1284-1287 (2003).

Millard, C.S., Stols, L., Quartey, P., Kim, Y., Dementieva, I., and Donnelly, M.I., "A Less Laborious Approach to the High-Throughput Production of Recombinant Proteins in *Escherichia coli* Using Two-Liter Plastic Bottles," *Protein Expression and Purification* 29:311-320 (2003).

O'Loughlin, E.J., Kelly, S.D., Cook, R.E., Csencsits, R., and Kemner, K.M., "Reduction of Uranium (VI) by Mixed Iron (II)/Iron(III) Hydroxide (Green Rust): Formation of UO₂ Nanoparticles," *Environmental Science and Technology* 37:721-727 (2003).

O'Loughlin, E.J., Kemner, K.M., and Burris, D.R., "Effects of Ag(I), Au(III), and Cu(II) on the Reductive Dechlorination of Carbon Tetrachloride by Green Rust," *Environmental Science and Technology* 37:2905-2912 (2003).

Orlandini, K.A., Bowling, J.W., Pinder, III, J.E., and Penrose, W.R., "⁹⁰Y-⁹⁰Sr Disequilibrium in Surface Waters: Investigating Short-Term Particle Dynamics by Using a Novel Isotope Pair," *Earth and Planetary Science Letters* 207:141-150 (2003).

Pataki, D.E., Ellsworth, D.S., Evans, R.D., Gonzalez-Meler, M., King, J., Leavitt, S.W., Lin, G., Matamala, R., Pendall, E., Siegwolf, R., Van Kessel, C., and Ehleringer, J.R., "Tracing Changes in Ecosystem Function under Elevated Carbon Dioxide Conditions," *BioScience* 53(9):805-818 (2003).

Price, H.U., Jaffe, D.A., Doskey, P.V., McKendry, I., and Anderson, T.L., "Vertical Profiles of O₃, Aerosols, CO, and NMHCs in the Northeast Pacific during the TRACE-P and ACE-ASIA Experiments," *Journal of Geophysical Research* 108(D20):8799 (2003).

Rajaniemi, T.K., Allison, V.J., and Goldberg, D.E., "Root Competition Can Cause a Decline in Diversity with Increased Productivity," *Journal of Ecology* 91:407-416 (2003).

Revercomb, H.E., Turner, D.D., Tobin, D.C., Knuteson, R.O., Feltz, W.F., Barnard, J., Bosenberg, J., Clough, S., Cook, D., Ferrare, R., Goldsmith, J., Gutman, S., Halthore, R., Lesht, B., Liljegren, J., Linne, H., Michalsky, J., Morris, V., Porch, W., Richardson, S., Schmid, B., Splitt, M., Van Hove, T., Westwater, E., and Whiteman, D., "The ARM Program's Water Vapor Intensive Observation Periods — Overview, Initial Accomplishments, and Future Challenges," *Bulletin of the American Meteorological Society* 84:217-236 (2003).

Song, J., and Wesely, M.L., "On Comparison of Modeled Surface Flux Variations to Aircraft Observations," *Agricultural and Forest Meteorology* 117:159-171 (2003).

Song, J., Lu, D., and Wesely, M.L., "A Simplified Atmospheric Correction Procedure for the Normalized Difference Vegetation Index," *Photogrammetric Engineering and Remote Sensing* 69(5):521-528 (2003).

Suzuki, Y., Kelly, S.D., Kemner, K.M., and Banfield, J.F., "Microbial Populations Stimulated for Hexavalent Uranium Reduction in Uranium Mine Sediment," *Applied and Environmental Microbiology* 69(3):1337-1346 (2003).

Turner, D.D., Lesht, B.M., Clough, S.A., Liljegren, J.C., Revercomb, H.E., and Tobin, D.C., "Dry Bias and Variability in Vaisala RS80-H Radiosondes: The ARM Experience," *Journal of Atmospheric and Oceanic Technology* 20:117-132 (2003).

Waples, J.T., Orlandini, K.A., Weckerly, K.M., Edgington, D.N., and Val Klump, J., "Measuring Low Concentrations of ²³⁴Th in Water and Sediment," *Marine Chemistry* 80:265-281 (2003).

Ware, R., Carpenter, R., Guldner, J., Liljegren, J., Nehrkorn, T., Solheim, F., and Vandenberghe, F., "A Multichannel Radiometric Profiler of Temperature, Humidity, and Cloud Liquid," *Radio Science* 38:8079 (2003).

Wei, C.-F., Kotamarthi, V.R., Ogunsola, O.J., Wuebbles, D.J., Avery, M.A., Blake, D.R., Browell, E.V., Sachse, G.W., and Sandholm, S.T., "Seasonal Variability of Ozone Mixing Ratios and Budgets in the Tropical Southern Pacific: A GCTM Perspective," *Journal of Geophysical Research* (PT-B Special Issue) 107(24):10.1029/2001JD000772 (2002).

Westwater, E.R., Stankov, B.B., Cimini, D., Han, Y., Shaw, J.A., Lesht, B.M., and Long, C.N., "Radiosonde Humidity Soundings and Microwave Radiometers during Nauru99," *Journal of Atmospheric and Oceanic Technology* 20:953-971 (2003).

Xu, Y., Wesely, M.L., and Pierce, T.E., "Estimates of Biogenic Emissions Using Satellite Observations and Influence of Isoprene Emission on O₃ Formation over the Eastern United States," *Atmospheric Environment* 36:5819-5829 (2003).

Zaveri, R.A., Berkowitz, C.M., Kleinman, L.I., Springston, S.R., Doskey, P.V., Lonneman, W.A., and Spicer, C.W., "Ozone Production Efficiency and NO_x Depletion in an Urban Plume: Interpretation of Field Observations and Implications for Evaluating O₃-NO_x-VOC Sensitivity," *Journal of Geophysical Research* 108(D14):4436 (2003).

Zhu, Y.-G., and Miller, R.M., "Carbon Cycling by Arbuscular Mycorrhizal Fungi in Plant-Soil Systems," *Trends in Plant Science* 8:407-409 (2003).

2. Unrefereed Books, Book Chapters, and Collections of Conference Proceedings

Fenter, P., Rivers, M., Sturchio, N.C., and Sutton, S., editors, *Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science*, Volume 49, Reviews in Mineralogy and Geochemistry, Geochemical Society and Mineralogical Society of America, Washington, D.C. (2002).

Wesely, M.L., "Dry Deposition," Chapter 18, pp. 347-355 in *Handbook for Climate, Weather, and Oceans*, edited by T.D. Potter and B.R. Colman, John Wiley and Sons, Inc., New York (2003).

3. Reports

Burton, J.C., *Final Master Work Plan: Environmental Investigations at Former CCC/USDA Facilities in Nebraska, 2002 Revision*, ANL/ER/TR-02/003, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2002).

Burton, J.C., *Final Master Work Plan: Environmental Investigations at Former CCC/USDA Facilities in Kansas, 2002 Revision*, ANL/ER/TR-02/004, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2002).

Burton, J.C., *Final Phase II Report: QuickSite® Investigation, Adams, Nebraska*, ANL/ER/TR-02/002, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2002).

Fenter, P., Park, C., Cheng, L., Zhang, Z., and Sturchio, N.C., “Face-Specific Dissolution Kinetics: Orthoclase (001) vs. (010),” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/FENTERP1.PDF> (2002).

Fenter, P., Park, C., Cheng, L., Zhang, Z., Sturchio, N.C., McBride, M.T., Srajer, G., and Bosbach, D., “Structure of a Crystal Growth Inhibitor Adsorbed at the Barite (001)-Water Interface,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/FENTERP2.PDF> (2002).

Kelly, S.D., Kemner, K.M., and Coates, J.C., “XAFS Investigations of the Interaction of U(VI) with Bio-Oxidizing *Dechlorosoma suillum*,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/SKELLY1.PDF> (2002).

Kelly, S.D., Kemner, K.M., Suzuki, Y., and Banfield, J.F., “XAFS Study of U(VI) Bioremediation Products,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/SKELLY2.PDF> (2002).

Kelly, S.D., Newville, M.G., Cheng, L., Kemner, K.M., Sutton, S.R., Fenter, P., Sturchio, N.C., and Spotl, C., “XAFS Determination of a Stable Crystallographic Site for Uranyl Impurities in Natural Calcite,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/SKELLY3.PDF> (2002).

LaFreniere, L.M., *Final Phase I Report and Phase II Work Plan: QuickSite® Investigation, Centralia, Kansas*, ANL/ER/TR-02/009, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2003).

LaFreniere, L.M., *Final Phase II Report: QuickSite® Investigation, Everest, Kansas*, ANL/ER/TR-03/003, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2003).

LaFreniere, L.M., *Final Work Plan: Phase I Expedited Site Characterization, Morrill, Kansas*, ANL/ER/TR-03/001, prepared for Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois (2003).

McCarthy, J.F., Jemian, P.R., Ilavsky, J., and Jastrow, J.D., “The Physical Basis of Carbon Sequestration in Soil Macroaggregates,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/MCCARTH1.PDF> (2002).

Park, C., Zhang, Z., Cheng, L., Fenter, P., and Sturchio, N.C., “Interfacial Structure of the Fluorapatite (100)-Water Interface by Using High-Resolution X-ray Reflectivity,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/PARKC1.PDF> (2002).

Rihs, S., Sturchio, N.C., Orlandini, K.A., Cheng, L., Fenter, P., and Bedzyk, M.J., “The Interaction of Uranyl with the Calcite Surface: Batch Sorption and Synchrotron X-ray

Standing Wave Studies,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/STURCHI1.PDF> (2002).

Schlegel, M.L., Nagy, K.L., Fenter, P., and Sturchio, N.C., “Atomic-Scale Structure of Quartz (1, 0, -1, 0)- and (1, 0, -1, 1)-Water Interfaces,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/NAGYK1.PDF> (2002).

Zhang, Z., Fenter, P., Cheng, L., Sturchio, N.C., Park, C.Y., Bedzyk, M.J., Machesky, M.L., Anovitz, L.M., and Wesolowski, D.J., “Atomic-Scale Structure of Rutile (110)-Water Interface by Using High Resolution X-ray Reflectivity,” *Advanced Photon Source Activity Report 2001*, ANL-02/06, <http://www.aps.anl.gov/apsar2001/ZHANGZ1.PDF> (2002).

4. Unrefereed Conference Papers

Doran, J.C., Coulter, R.L., Martin, T.J., and Shaw, W.J., “Orographic Flows in the Phoenix Area and Their Implications for Vertical Mixing,” Paper 11.8, *Tenth Conference on Mesoscale Processes*, Portland, Oregon, June 23-27, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=62438> (2003).

Doskey, P.V., Kotamarthi, V.R., Price, H.U., and Dugopolski, R., “NMHC Measurements for the Phoenix 2001 Field Experiment,” Paper 4.4, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=58665> (2003).

Ferrare, R.A., Browell, E.V., Ismail, S., Barrick, J., Diskin, G., Kooi, S., Brasseur, L.H., Brackett, V.G., Clayton, M., Lesht, B., Miloshevich, L., Podolske, J., Schmidlin, F., Turner, D.D., and Whiteman, D., “Lidar Characterizations of Water Vapor Measurements over the ARM SGP Site,” Paper JP2.9, *83rd Annual Meeting of the American Meteorological Society*, Long Beach, California, February 9-13, 2003, <http://ams.confex.com/ams/pdfpapers/56233.pdf> (2003).

Gaffney, J.S., and Marley, N.A., “Chemist and Meteorologist — Antoine Lavoisier,” Paper 1.1, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=56568> (2003).

Gaffney, J.S., and Marley, N.A., “Natural Radioactivity in Aerosols and What It Can Tell Us,” Paper 7.2, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=56571> (2003).

Gaffney, J.S., and Marley, N.A., “The Importance of the Chemical and Physical Properties of Aerosols in Determining Their Transport and Residence Times in the Troposphere,” pp. 1387-1392 in *Urban Aerosols and Their Impact: Lessons Learned from the World Trade Center Tragedy*, New York, September 7-11, 2003, American Chemical Society, on CD-ROM.

Kotamarthi, V.R., “Development of TLM/Adjoint Photochemical Trajectory Model,” Paper 5.2, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California,

February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=54043> (2003).

Marley, N.A., and Gaffney, J.S., "Air Quality Measurements in Phoenix, Arizona," Paper P1.10, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=56579> (2003).

Marley, N.A., Gaffney, J.S., Gunter, R.L., and Luke, W.T., "New Improved Fast GC-Luminol Instrument for PAN and Nitrogen Dioxide Measurements," Paper 1.6, *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=56552> (2003).

Miller, R.M., "Commentary on 'A Role for Genetically Modified Organisms in Soil Carbon Sequestration,'" *Applications of Biotechnology to Mitigation of Greenhouse Warming: Proceedings of the St. Michaels Workshop*, Battelle Press, Columbus, Ohio (2003).

Wesely, M.L., and Song, J., "Modeling Multiyear Surface Evapotranspiration with Remote Sensing Data," Paper J9.5, *17th Conference on Hydrology*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=55257> (2003).

Xu, Y., and Wesely, M.L., "A Study of Ozone Concentration in the Eastern United States with a Dry Deposition Scheme Using Satellite Data," Paper 3.4 in *Fifth Conference on Atmospheric Chemistry*, Long Beach, California, February 9-13, 2003, American Meteorological Society, Boston, Massachusetts, <http://ams.confex.com/ams/pdfview.cgi?username=53982> (2003).

5. Published Abstracts, Notes, Reviews, Comments, and Letters

Allison, V.J., Miller, R.M., Jastrow, J.D., and Matamala, R., "Characterization of Environmental and Edaphic Factors Affecting Soil Microbial Communities Using a Tallgrass Prairie Restoration Chronosequence," pp. 17-18 in *Book of Abstracts*, Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003 (2003).

Allison, V.J., Miller, R.M., Jastrow, J.D., and Matamala, R., "Characterization of Environmental and Edaphic Factors Affecting Soil Microbial Communities Using a Tallgrass Prairie Restoration Chronosequence," p. 10 in *Annual Meeting Abstracts*, 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 3-8, 2003 (2003).

Arora, M.B., Hestekin, J.A., Lin, Y.J., Samaha, H., Davila, J., Eschenfeldt, W.H., Donnelly, M.I., St. Martin, E.J., and Snyder, S.W., "Controlled Immobilization of Biocatalytic Enzymes in Separative Bioreactors," in *Abstracts*, 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 4-7, 2003 (2003).

Berkowitz, C.M., Doskey, P.V., Spicer, C.W., and Zaveri, R.A., "A Box-Model Analysis of Ozone Production Potential as a Function of Source Region in the Houston/Galveston Area," abstract in *Eos Transactions, American Geophysical Union* 83(47):A12D-0183 (2002).

Boyanov, M., Kelly, S., Kemner, K., Bunker, B., Fein, J.B., and Fowle, D.A., "The pH-Dependent Mechanism of Cd Adsorption to *B. subtilis*," p. 286 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Boyanov, M., Kmetko, J., Shibata, T., Datta, A., Dutta, P., and Bunker, B.A., "XAFS of Pb Adsorption to C21 Acid Langmuir Monolayers," p. 73 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Boyanov, M., Shibata, T., Kelly, S., Kemner, K., and Bunker, B., "XAFS of Mn, Cu, Pb, Cd, Cr Perchlorate and Acetate Solutions," p. 169 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Chattopadhyay, S., Kelly, S.D., Palkar, V.R., Fan, L., and Segre, C.U., "Investigation of Size Effects in the Magnetoelectric BiFeO₃ Systems," p. 139 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Clough, S.A., Cady-Periera, K., Boukabara, S., Clothiaux, E.E., Liljegren, J.C., and Turner, D.D., "Physical Retrievals of PWV and CLW from ARM Microwave Radiometers," p. 27 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Cook, D.R., "Is EPA Too Quick to Shower Praise on the Acid Rain Program?" in *Zephyr*, newsletter of the Allegheny Mountain Section, Air and Waste Management Association, Compliance Corner, D. Haggerty, editor, March 2003, vol. 21, no. 7 (2003).

Cook, D.R., Ritsche, M.T., Holdridge, D.J., and Wesely, M.L., "SGP Instrument Performance and Data Quality Reporting for 2002," p. 29 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Doskey, P.V., Kotamarthi, V.R., Harris, L., and Ochsner, H., "Ozone in Metropolitan Chicago: Land-Lake Breeze Effects," Abstract 151, *35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2003).

Fenter, P., "Book Review: *Synchrotron Radiation: Earth, Environmental and Material Sciences Application*, Grant S. Henderson and Don R. Baker, Editors (Short Course Series, Vol. 30, Robert Raeside, Series Editor), Mineralogical Association of Canada, Ontario, Canada, 2002, 178 pp., ISBN 0-921294-30-1 (\$40)," *Chemical Geology* 194:349-350 (2003).

Ferrare, R.A., Browell, E.V., Ismail, S., Barrick, J., Diskin, G., Kooi, S., Brasseur, L.H., Brackett, V.G., Clayton, M., Lesht, B., Miloshevich, L., Podolske, J., Schmidlin, F., Turner, D.D., and Whiteman, D., "Lidar Characterizations of Water Vapor Measurements over the ARM SGP Site," *83rd Annual Meeting of the American Meteorological Society*, Long Beach, California, February 9-13, 2003, http://ams.confex.com/ams/annual2003/techprogram/paper_56233.htm (2003).

Fosco, T., Schmeling, M., Doskey, P., Kotamarthi, V., Ochsner, H., and Harris, L., "Land-Lake Breeze Effect Studies in Chicago — Ionic Species," Abstract 99, *35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2003).

Gaffney, J.S., and Marley, N.A., "PAN, Nitrogen Dioxide, and Ozone Measurements at Deer Park, Texas, during TexAQS 2000," abstract in *Eos, Transactions, American Geophysical Union* 83:F155 (2002).

Gaffney, J.S., "The Global Change Education Program — Lessons Learned," Abstract 161, *Chemistry Serving Society, 35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2004).

Gaffney, J.S., and Marley, N.A., "Antoine Lavoisier — Father of Atmospheric Science," Abstract 66, *Chemistry Serving Society, 35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2004).

Hanson, P.J., Trumbore, S., Gaudinski, J., Swanston, C., Torn, M., Jastrow, J., Joslin, J.D., and Jardine, P., "Enriched Background Isotope Study (EBIS): Application of an Ecosystem-Scale ^{14}C Tracer to Soil-Carbon-Cycle Studies," S07-hanson09634-Poster in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

Hawley, N., and Lesht, B.M., "What Maintains the Benthic Nepheloid Layer?" p. 163 in *Abstracts*, 46th Annual International Association for Great Lakes Research Conference, Chicago, Illinois, June 24-25, 2003 (2003).

Holdridge, D., "Atmospheric Aerosol Study in Progress," p. 1 in *Ponca City News*, Ponca City, Oklahoma, May 15, 2003 (2003).

Holdridge, D., "Local Students Explore ARM Program Site," p. 14 in *Tonkawa News*, Tonkawa, Oklahoma, March 20, 2003 (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, October 2002, ANL/ER/NL-02-10, Argonne National Laboratory, Argonne, Illinois (2002).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, November 2002, ANL/ER/NL-02-11, Argonne National Laboratory, Argonne, Illinois (2002).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, December 2002, ANL/ER/NL-02-12, Argonne National Laboratory, Argonne, Illinois (2002).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, January 2003, ANL/ER/NL-03-01, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, February 2003, ANL/ER/NL-03-02, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, March 2003, ANL/ER/NL-03-03, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, April 2003, ANL/ER/NL-03-04, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, May 2003, ANL/ER/NL-03-05, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, June 2003, ANL/ER/NL-03-06, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, July 2003, ANL/ER/NL-03-07, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, August 2003, ANL/ER/NL-03-08, Argonne National Laboratory, Argonne, Illinois (2003).

Holdridge, D., *Atmospheric Radiation Measurement Program Facilities Newsletter*, September 2003, ANL/ER/NL-03-09, Argonne National Laboratory, Argonne, Illinois (2003).

Imre, D., Brechtel, F., Zelenyuk, A., Doskey, P., Spicer, C., Joseph, D., Berkowitz, C., Alexander, M., Cowin, J., Weinstein-Lloyd, J., and Baumann, K., "Observations from the Williams Tower Measurement Site during TexAQS 2002: An Overview," abstract in *Eos Transactions, American Geophysical Union* 83(47):A21F-06 (2002).

Jastrow, J.D., "Mean Residence Time of Soil Carbon Pools: Controlling Factors and Implications for Soil Carbon Cycling," pp. 166-167 in *Annual Meeting Abstracts*, 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 3-8, 2003 (2003).

Jastrow, J.D., O'Brien, S.L., Van Til, B.E., Matamala, R., Swanston, C.W., and Hanson, P.J., "Incorporation of a Whole Ecosystem Radiocarbon Label into Unprotected and Protected Soil Carbon Pools," p. 47 in *Book of Abstracts*, Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003 (2003).

Jastrow, J.D., Six, J., and Ullian, J.J., "Testing an Aggregate-Based Fractionation Technique to Detect Soil Carbon Storage in Mineral-Associated Fractions," p. 46 in *Book of Abstracts*, Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003 (2003).

Jastrow, J.D., Six, J., and Ullian, J.J., "Testing an Aggregate-Based Fractionation Technique to Detect Soil C Storage in Mineral-Associated Fractions," S03-jastrow042044-Poster in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

Kelly, S.D., Kemner, K.M., Brooks, S.C., Fredrickson, J.K., Carroll, S.L., Kennedy, D.W., Zachara, J.M., Plymale, A.E., and Fendorf, S., "Ca-UO₂-CO₃ Complexation — Implications for Bioremediation of U(VI)," p. 187 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Kelly, S.D., Kemner, K.M., Brooks, S.C., Fredrickson, J.K., Kennedy, D.W., Zachara, J.M., Fendorf, S., Plymale, A., and Carroll, S.L., "Direct Evidence for Ca-UO₂-CO₃ Complexation," p. 18 in *Division of Nuclear Chemistry and Technology Abstracts*, 225th American Chemical Society National Meeting, New Orleans, Louisiana, March 2003 (2003).

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Moe, L.A., Fox, B.G., Donnelly, M.I., and Giometti, C.S., "XRF and XAFS Analysis of Electrophoretically Isolated Non-Denatured Proteins," p. 284 in *Program and Abstracts XAFS 12*, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003 (2003).

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Nealson, K.H., Lai, B., Maser, J., and Cai, Z., "Investigation of the Spatial Distributions and Concentrations of Biologically and Environmentally Relevant Elements at the Mineral-Microbe Interface," p. 14 in *Abstracts, DOE-NABIR PI Workshop*, Warrenton, Virginia, March 2003 (2003).

Kim, Y.C., Donnelly, M., Collart, F., Dementieva, I., and Joachimiak, A., "The Midwest Center for Structural Genomics Approach to Automated Gene Cloning, Protein Expression, Purification, and Crystallization," in *Abstracts, Protein Structure Initiative: Protein Purification and Crystallization Workshop*, Bethesda, Maryland, April 9-11, 2003 (2003).

Kotamarthi, V.R., "Effect of Fast Chemistry on Measured Surface Fluxes of Trace Atmospheric Gases," Abstract 155, *35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2003).

Lesht, B.M., Hawley, N., and Stroud, J.R., "Sensitivity Analysis of a Zero-Dimensional Sediment Resuspension Model," p. 162 in *Abstracts, 46th Annual International Association for Great Lakes Research Conference*, Chicago, Illinois, June 24-25, 2003 (2003).

Lesht, B.M., Leshkevich, G.A., Stroud, J.R., Schwab, D.J., and Stein, M.L., "Application of Satellite Observations of Water Color to Study of the Great Lakes," p. 101 in *Abstracts, 46th Annual International Association for Great Lakes Research Conference*, Chicago, Illinois, June 24-25, 2003 (2003).

Liljegren, J.C., "Improved Retrievals of Liquid Water Path Using a Twelve-Channel Microwave Radiometer," p. 71 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Liljegren, J.C., "Improved Retrievals of Temperature and Water Vapor Profiles Using a Twelve-Channel Microwave Radiometer," p. 71 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Marley, N.A., and Gaffney, J.S., "Measurements of Natural Radioactivity in Submicron Aerosols in the Pittsburgh Area," abstract in *Eos, Transactions, American Geophysical Union* 83:F57 (2002).

Matamala, R., Jastrow, J.D., Amthor, J.S., Garten, C.T., and Miller, R.M., "Increasing Soil Carbon and Nitrogen Stocks under Restored Tallgrass Prairie: Influence of Soil Type," S03-matamala115822-Oral in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

Millard, C.S., Stols, L., Quartey, P., Kim, Y., Dementieva, I., and Donnelly, M.I., "Two-Liter Plastic Bottles as Disposable Culture Vessels for the Production of Recombinant Proteins in *Escherichia coli*," in *Abstracts*, Society of Industrial Microbiology Annual Meeting, Minneapolis, Minnesota, August 10-14, 2003 (2003).

Miller, R.M., "Arbuscular Mycorrhizal Fungi Influence Soil Structure," p. 51 in *Proceedings of International Workshop on Soil-Plant Interactions*, Beijing, China, October 27-30, 2002 (2002).

Miller, R.M., "The Contributions of Arbuscular Mycorrhizal Fungi to Sustainable Development," Abstract 39 in *Abstract Book, Indo-US Workshop and National Congress on Molecular Biology and Biotechnological Symbiosis*, edited by A. Varma, G.K. Podila, and R.B.S. Rawat, Jawaharlal Nehru University, New Delhi, India (2003).

Miller, R.M., "The Function of Mycorrhizal Fungi in Soil Restoration," p. 21 in *International Workshop on Microbial Function in Revegetated Process of Degraded Terrestrial Environments: From Gene through to Ecosystem*, Tokyo, Japan, November 29, 2002 (2002).

Miller, R.M., "The Importance of the Mycorrhizal Symbiosis to Global Climate Change," Abstract 40 in *Abstract Book, Indo-US Workshop and National Congress on Molecular Biology and Biotechnological Symbiosis*, edited by A. Varma, G.K. Podila, and R.B.S. Rawat, Jawaharlal Nehru University, New Delhi, India (2003).

Miller, R.M., Chaudhary, V., Gades, L., Jastrow, J.D., Kirt, S., Matamala, R., and Skogen, K.A., "Is There a Mycorrhizal Fungal Response to CO₂ Fumigation in the Field?" pp. 55-56 in *Book of Abstracts*, Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003 (2003).

Miller, R.M., Wright, S.F., and Jastrow, J.D., "Glomalin Contributions to Soil Carbon and Nitrogen Pools in a Prairie Reconstruction," S03-miller120016-Poster in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

Nissen, T.M., Rodriguez, V.V., Matamala, R., Jastrow, J.D., and Wander, M.M., "Sampling Soybean Roots: A Comparison of Excavation and Coring Methods," S08-nissen122827-Poster in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

O'Brien, S.L., Jastrow, J.D., Pregitzer, K.S., and Zak, D.R., "Effect of Soil Fertility on Physically Fractionated Soil C and N Pools of Sandy Soils Exposed to Elevated Atmospheric CO₂," S03-jastrow161704-Poster in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

O'Brien, S.L., Jastrow, J.D., Pregitzer, K.S., and Zak, D.R., "Effect of Soil Fertility on Physically Fractionated Soil Carbon and Nitrogen Pools of Sandy Soils Exposed to Elevated Atmospheric CO₂," p. 60 in *Book of Abstracts*, Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003 (2003).

Peppler, R.A., Bond, D., Dean, A., Sonntag, K., Bahrmann, C.P., Richardson, S., Choudhari, C., Doty, K.J., Stampf, D., Wagener, R., Cook, D.R., McCord, R.A., and Palanisamy, G., "The Data Quality Reporter System," p. 93 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Petracca, B., Church, H., Zak, B.D., Storvold, R., and Lesht, B.M., "Analysis of Selected Radiosonde Data from the ARM/NSA Site," p. 94 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Post, W.M., Izaurrealde, R.C., and Jastrow, J.D., "Integrated Analysis of Soil Carbon Sequestration Enhancement Methods," S07-post114554-Oral in *Annual Meeting Abstracts 2002*, Annual Meeting of the Soil Science Society of America, Indianapolis, Indiana, November 10-14, 2002, on CD-ROM (2002).

Price, H.U., Jaffe, D.A., Doskey, P.V., and Jaegle, L., "Determination of OH during Trans-Pacific Transport of Pollutants Using NMHC Ratios and Backward Trajectories: Role of Heterogeneous Chemistry," abstract in *Eos Transactions, American Geophysical Union* 83(47):A62B-0168 (2002).

Reilly, C.A., *Chemical Hygiene Plan 2003*, Environmental Research Division, Argonne National Laboratory, Argonne, Illinois, <http://www.anl.gov/ER/images/chemicalplan.pdf> (2003).

Reilly, C.A., *Safety, Health, and Environmental Protection Policy and Procedures Manual, February 2003*, Environmental Research Division, Argonne National Laboratory, Argonne, Illinois, <http://www.anl.gov/ER/images/safety-erd.pdf> (2003).

Schmeling, M., Fosco, T., Doskey, P., Kotamarthi, V., Ochsner, H., and Harris, L., "Characterization of Airborne Particulate Matter during the Land-Lake Breeze Effect Study in Chicago, IL," Abstract 158, *35th Great Lakes Regional Meeting of the American Chemical Society*, Chicago, Illinois, May 31-June 2, 2003 (2003).

Sisterson, D.L., Jones, L., Kornke, W., Liljegren, J.C., McCord, R., Peppler, R., Teske, J.J., Zak, B., and Zirzow, J., "Quantitative Performance Assessment of Data Availability for ARM CART," p. 107 in *Abstracts, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting*, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Smith, E.A., Gonzalez-Meler, M.A., Matamala, R., Jastrow, J.D., and Miller, R.M., "Carbon Dynamics of a Restored Tallgrass Prairie Chronosequence Assessed with Stable Isotopes," p. 311 in *Annual Meeting Abstracts*, 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 3-8, 2003 (2003).

St. Martin, E.J., Lin, Y.J., Hestekin, J.A., Arora, M.B., Millard, C.S., Snyder, S.W., and Donnelly, M.I., "Production of Lactic Acid in a pH-Controlled Separative Bioreactor," in *Abstracts*, 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 4-7, 2003 (2003).

Sultan, M., Becker, R., Jastrow, J.D., Miller, R.M., Kim, J., and El Alfy, Z., "Land Cover and Land Use Changes and Their Impacts on Groundwater Resources and Carbon Cycling in Southwestern Egypt," Abstract H52A-0825 in *Fall Meeting Supplement, Eos Transactions, American Geophysical Union* 83(47) (2002).

Tobin, D., Revercomb, H., Feltz, W., Knuteson, R., Turner, D., Lesht, B., Strow, L., Barnett, C., and Fetzer, E., "ARM Site Atmospheric State Best Estimates for AIRS Validation," p. 113 in *Abstracts*, Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, March 31-April 4, 2003 (2003).

Zaveri, R.A., Berkowitz, C.M., Kleinman, L.I., Springston, S.R., Doskey, P.V., and Spicer, C.W., "Evaluation of Ozone Production Efficiency in an Urban Plume Using a Lagrangian Box Model," abstract in *Eos Transactions, American Geophysical Union* 83(47):A51B-0047 (2002).

6. Oral Presentations (speaker underlined)

Allison, V.J., Miller, R.M., Jastrow, J.D., and Matamala, R., "Characterization of Environmental and Edaphic Factors Affecting Soil Microbial Communities Using a Tallgrass Prairie Restoration Chronosequence," Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003.

Allison, V., Miller, R.M., Jastrow, J., and Matamala, R., "Characterization of Environmental and Edaphic Factors Affecting Soil Microbial Communities Using a Tallgrass Prairie Restoration Chronosequence," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Allison, V.J., Miller, R.M., Jastrow, J.D., and Matamala, R., "Characterization of Environmental and Edaphic Factors Affecting Soil Microbial Communities Using a Tallgrass Prairie Restoration Chronosequence," 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 3-8, 2003.

Alvarado, J., Boulding, R., and Rose, C., "Retardation Factors for Carbon Tetrachloride in Groundwater," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Arora, M.B., Hestekin, J.A., Lin, Y.J., Samaha, H., Davila, J., Eschenfeldt, W.H., Donnelly, M.I., St. Martin, E.J., and Snyder, S.W., "Controlled Immobilization of Biocatalytic Enzymes in Separative Bioreactors," 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 4-7, 2003.

Barnes, F., Talus, C., Marsh, L., Springer, M., Brower, R., and Zak, B. (presented by D. Sisterson), "ARM's Climate Change Educational Outreach in the North Slope of Alaska," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Bei, L., Demirgian, J.C., and Carnahan, J., "Characterization of an Acousto-optic Tunable Filter and Use in Near-Infrared Spectrometry," Pittcon 2003, Orlando, Florida, March 5, 2003.

Berkowitz, C.M., Doskey, P.V., Spicer, C.W., and Zaveri, R.A., "A Box-Model Analysis of Ozone Production Potential as a Function of Source Region in the Houston/Galveston Area," 2002 Fall Meeting of the American Geophysical Union, San Francisco, California, December 6-10, 2002.

Boyanov, M., Kelly, S., Kemner, K., Bunker, B., Fein, J., and Fowle, D., "Cd Adsorption to *B. subtilis* Bacterial Cell Walls — A pH-Dependent XAFS Spectroscopy Study," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Boyanov, M., Kelly, S., Kemner, K., Bunker, B., Fein, J.B., and Fowle, D.A., "The pH-Dependent Mechanism of Cd Adsorption to *B. subtilis*," XAFS 12, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003.

Boyanov, M., Kmetko, J., Shibata, T., Datta, A., Dutta, P., and Bunker, B., "Aqueous Pb Adsorption at the Water-Langmuir Monolayer Interface Studied by Grazing Incidence XAFS Spectroscopy," Advanced Photon Source Users' Meeting, Argonne, Illinois, April 29, 2003.

Boyanov, M., Shibata, T., Kelly, S., Kemner, K., and Bunker, B., "XAFS of Mn, Cu, Pb, Cd, Cr Perchlorate and Acetate Solutions," XAFS 12, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003.

Chattopadhyay, S., Kelly, S.D., Palkar, V.R., Fan, L., and Segre, C.U., "Investigation of Size Effects in the Magnetoelectric BiFeO₃ Systems," XAFS 12, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003.

Cheng, L., Bedzyk, M.J., Sturchio, N.C., and Fenter, P., "Fourier Reconstruction of Adsorbate Crystallographic Distributions Using X-ray Standing Waves," 226th National Meeting of the American Chemical Society, New York, New York, September 7-11, 2003.

Cheng, L., Fenter, P., Bedzyk, M.J., and Sturchio, N.C., "Direct Crystallography of Trace Elements in Minerals Using X-ray Standing Waves," American Geophysical Union National Meeting, San Francisco, California, December 6, 2002.

Cheng, L., Zhang, Z., Fenter, P., Sturchio, N.C., and Bedzyk, M.J., "Direct Imaging of Atom Distributions in a Crystal Lattice by X-ray Standing Waves," Gordon Conference on X-ray Physics, Bristol, Rhode Island, July 13-18, 2003.

Clough, S.A., Cady-Periera, K., Boukabara, S., Clothiaux, E.E., Liljegren, J.C., and Turner, D.D., "Physical Retrievals of PWV and CLW from ARM Microwave Radiometers," Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 2, 2003.

Cook, D.R., Ritsche, M.T., Holdridge, D.J., and Wesely, M.L., "SGP Instrument Performance and Data Quality Reporting for 2002," Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Coulter, R.L., "Atmospheric Boundary Layer Experiments — ABLE," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Demirgian, J.C., "ChemVision — A Near-Infrared Hyperspectral Imaging Camera That Provides Chemical Identification Superimposed upon a Video Image," LDRD Mini-Symposium, Argonne National Laboratory, Argonne, Illinois, October 31, 2002.

Demirgian, J.C., Carney, K.P., and Barber, D.B., "Integration of Quality Control with Automated Analysis of Infrared Data," Pittcon 2003, Orlando, Florida, March 4, 2003.

Donnelly, M.I., Kim, Y., and Dementieva, I., "Midwest Center for Structural Genomics' Pipeline," NIH Protein Production and Crystallization Workshop, Bethesda, Maryland, April 10-13, 2003.

Doskey, P.V., "Atmospheric Chemistry of Light Hydrocarbons in Urban Air," Joint Seminar Series of the Environmental Engineering and Remote Sensing Program, Department of Civil and Environmental Engineering, Michigan Technological University, Houghton, Michigan, March 28, 2003.

Doskey, P.V., "Atmospheric Chemistry of Light Hydrocarbons in Urban Air," Environmental Chemistry and Technology Program, University of Wisconsin, Madison, Wisconsin, April 25, 2003.

Doskey, P.V., "Ozone and Aerosols in Chicago," LDRD Mini-Symposium, Argonne National Laboratory, Argonne, Illinois, June 2, 2003.

Doskey, P.V., and Kotamarthi, V.R., "Chemical Processing of NMOC Emissions from Urban and Rural Landscapes," NARSTO's Annual Meeting of its Executive Assembly, North American Research Strategy for Tropospheric Ozone, Washington, D.C., March 26, 2003.

Doskey, P.V., Kotamarthi, V.R., Price, H.U., and Dugopolski, R., "NMHC Measurements for the Phoenix 2001 Field Experiment," Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting, American Meteorological Society, Long Beach, California, February 11, 2003.

Doskey, P.V., Kotamarthi, V.R., Harris, L., and Ochsner, H., "Ozone in Metropolitan Chicago: Land-Lake Breeze Effects," 35th Great Lakes Regional Meeting, American Chemical Society, Chicago, Illinois, June 1, 2003.

Fenter, P., "Direct Measurements of Water and Ion Distributions at the Mineral-Water Interface," Seminar, Department of Physics, University of Illinois at Chicago, Chicago, Illinois, October 17, 2002.

Fenter, P., "Direct Observations of Mineral-Water Interfaces," Department of Physical, Biological, and Chemical Sciences, Illinois Institute of Technology, Chicago, Illinois, February 12, 2003.

Fenter, P., "Structure of Water at Water-Mineral Interfaces," Symposium on the Physicochemistry of Water and Dynamics of Materials and the Earth: Structures and

Behavior of Thin-Film Water, Tokyo Institute of Technology, Tokyo, Japan, September 13, 2003.

Fenter, P., "X-ray Reflectivity as a Probe of Mineral-Water Interfaces: A User Guide," Reviews in Mineralogy and Geochemistry Short Course, Monterey, California, December 4, 2002.

Fenter, P., "X-ray Scattering and Standing Wave Studies of the Mineral-Water Interface," Colloquium, SPring-8 (Japan Synchrotron Radiation Research Institute), Harima, Japan, September 12, 2003.

Fenter, P., Park, C., Zhang, Z., Cheng, L., and Sturchio, N.C., "Orthoclase Dissolution Mechanism at Acidic pH: New Constraints," 13th Goldschmidt Conference, Kurashiki, Japan, September 9, 2003.

Fenter, P., Zhang, Z., Park, C., Cheng, L., Wesolowski, D.J., Machesky, M., Bedzyk, M.J., and Sturchio, N.C., "A New View of Ion Adsorption at Mineral-Fluid Interfaces with X-ray Standing Waves," Stanford Synchrotron Radiation Laboratory Users Meeting, Menlo Park, California, October 7-9, 2002.

Fenter, P., Zhang, Z., Park, C., Cheng, L., Wesolowski, D.J., Machesky, M., Bedzyk, M.J., and Sturchio, N.C., "A New View of Ion Adsorption at Mineral-Fluid Interfaces with Synchrotron X-ray Scattering," AVS National Meeting, Denver, Colorado, November 4, 2002.

Ferrare, R.A., Browell, E.V., Ismail, S., Barrick, J., Diskin, G., Kooi, S., Brasseur, L.H., Brackett, V.G., Clayton, M., Lesht, B., Miloshevich, L., Podolske, J., Schmidlin, F., Turner, D.D., and Whiteman, D., "Lidar Characterizations of Water Vapor Measurements over the ARM SGP Site," 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 9-13, 2003.

Fosco, T., Schmeling, M., Doskey, P.V., Kotamarthi, V.R., Ochsner, H., and Harris, L., "Land-Lake Breeze Effect Studies in Chicago — Ionic Species," 35th Great Lakes Regional Meeting, American Chemical Society, Chicago, Illinois, May 31, 2003.

Gaffney, J.S., "Aerosols and Their Importance in Radiative Balance," Global Change Education Program Orientation, Portland, Oregon, June 10, 2003.

Gaffney, J.S., "Chicago and Mexico City Air Pollution," Fairview Village, Downers Grove, Illinois, September 25, 2003.

Gaffney, J.S., "Ecology and Carbon Sequestration Program Overview," Global Change Education Program Orientation, Portland, Oregon, June 11, 2003.

Gaffney, J.S., "Global Change Future Issues: Linkages and Feedbacks," Global Change Education Program Final Workshop, Arlington, Virginia, August 19, 2003.

Gaffney, J.S., "Goals and Objectives for 2003," Global Change Education Program Orientation, Portland, Oregon, June 8, 2003.

Gaffney, J.S., “Marvin L. Wesely (May 5, 1944-January 20, 2003), In Remembrance,” DOE-Atmospheric Science Program Review Meeting, Orlando, Florida, March 4, 2003.

Gaffney, J.S., “Marvin L. Wesely (May 5, 1944-January 20, 2003), Remembered,” Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 12, 2003.

Gaffney, J.S., “Mexico City Megacity 2003: Aerosols and Trace Gases — Some Recent Results,” Management Partners Meeting, Argonne National Laboratory, Argonne, Illinois, July 21, 2003.

Gaffney, J.S., “Mexico Megacity 2003,” DOE-Atmospheric Science Program Review Meeting, Orlando, Florida, March 5, 2003.

Gaffney, J.S., “Opportunities at the National Laboratories in Environmental Chemistry and Chemistry, and the Global Change Education Program,” New Mexico Tech Student Affiliates: Panel Discussion on Career and Educational Opportunities in Chemistry, American Chemical Society 2002 Rocky Mountain Regional Meeting, Albuquerque, New Mexico, October 12, 2002.

Gaffney, J.S., “Overview of Orientation,” Global Change Education Program Orientation, Portland, Oregon, June 9, 2003.

Gaffney, J.S., “SBIR Opportunities,” DOE-Atmospheric Science Program Review Meeting, Orlando, Florida, March 4, 2003.

Gaffney, J.S., “The Global Change Education Program — Lessons Learned,” Symposium on New Models for Undergraduate Research Programs, 35th Great Lakes Regional Meeting of the American Chemical Society, Chicago, Illinois, June 1, 2003.

Gaffney, J.S., and Lunn, P., “Mexico Megacity 2003,” White House Air Quality Research Subcommittee, Washington, D.C., November 21, 2002.

Gaffney, J.S., and Marley, N.A., “Antoine Lavoisier — Father of Atmospheric Science,” 35th Great Lakes Regional Meeting, American Chemical Society, Chicago, Illinois, May 31, 2003.

Gaffney, J.S., and Marley, N.A., “Chemist and Meteorologist — Antoine Lavoisier,” Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 9-13, 2003.

Gaffney, J.S., and Marley, N.A., "Importance of the Chemical and Physical Properties of Aerosols in Determining Their Transport and Residence Times in the Troposphere," Symposium on Urban Aerosols and Their Impact: Lessons Learned from the World Trade Center Tragedy, American Chemical Society 226th National Meeting, New York, New York, September 7-11, 2003.

Gaffney, J.S., and Marley, N.A., "Megacities and Their Global Impacts: Mexico City Air Quality Studies," Division of Educational Programs Summer Research Enrichment Lecture, Argonne National Laboratory, Argonne, Illinois, June 25, 2003.

Gaffney, J.S., and Marley, N.A., "Megacities and Their Impacts: From Urban to Global Scales," Global Change Education Program Orientation, Portland, Oregon, June 14, 2003.

Gaffney, J.S., and Marley, N.A., "Natural Radioactivity in Aerosols and What It Can Tell Us," Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 9-13, 2003.

Gaffney, J.S., and Marley, N.A., "PAN, Nitrogen Dioxide, and Ozone Measurements at Deer Park, Texas, during TexAQS 2000," American Geophysical Union 2002 Fall Meeting on Atmospheric Science, Special Session on TexAQS 2000, San Francisco, California, December 9, 2002.

Gaffney, J.S., and Marley, N.A., "Peroxyacetyl Nitrate and the MTBE Connection," Sixth Workshop on Mexico City Air Quality, Mexico City, Mexico, January 22, 2003.

Gaffney, J.S., and Marley, N.A., "Peroxyacyl Nitrates (PANs): Their Chemistry and Measurement," Chemistry Department, Massachusetts Institute of Technology, Cambridge, Massachusetts, February 5, 2003.

Gaffney, J.S., and Marley, N.A., "So How Do You Write and Successfully Publish a Scientific Paper or Abstract? (The Politics of Scientific Writing)," Global Change Education Program Orientation, Portland, Oregon, June 14, 2003.

Gaffney, J.S., and Marley, N.A., "The Atmospheric Science Program: Where Chemistry and Meteorology Hit the Road!" Global Change Education Program Orientation, Portland, Oregon, June 14, 2003.

Gaffney, J.S., and Marley, N.A., "Tropospheric Aerosols — The Air Quality and Climate Connection," Environmental Issues of the Southwest Symposium, American Chemical Society 2002 Rocky Mountain Regional Meeting, Albuquerque, New Mexico, October 13, 2002.

Gaffney, J.S., and Marley, N.A., "Update on Argonne Mexico City 2003/CENICA Measurements and PAN/VAN Data," Mexico City Metropolitan Area 2003 Field Study Results Workshop (MCMA-2003), Massachusetts Institute of Technology, Boston, Massachusetts, August 4, 2003.

Gaffney, J.S., Marley, N.A., and Frederick, J.E., "Urban Aerosol Measurements: Soot and Natural Radionuclides," LDRD Mini-Symposium, Argonne National Laboratory, Argonne, Illinois, October 31, 2002.

Hanson, P.J., Trumbore, S., Gaudinski, J., Swanston, C., Torn, M., Jastrow, J., Joslin, J.D., and Jardine, P., "Enriched Background Isotope Study (EBIS): Application of an Ecosystem-Scale ^{14}C Tracer to Soil-Carbon-Cycle Studies," Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 13, 2002.

Hawley, N., and Lesht, B.M., "What Maintains the Benthic Nepheloid Layer?" 46th Annual International Association for Great Lakes Research Conference, Chicago, Illinois, June 25, 2003.

Imre, D., Brechtel, F., Zelenyuk, A., Doskey, P., Spicer, C., Joseph, D., Berkowitz, C., Alexander, M., Cowin, J., Weinstein-Lloyd, J., and Baumann, K., "Observations from the Williams Tower Measurement Site during TexAQS 2002: An Overview," 2002 Fall Meeting of the American Geophysical Union, San Francisco, California, December 6-10, 2002.

Jastrow, J.D., "Aggregate Stabilization and Soil Carbon Storage: Dynamics and Mechanisms," Guest Lecture, Department of Natural Resources and Environmental Sciences Off-Campus Graduate Program, University of Illinois, Urbana-Champaign, Urbana, Illinois, April 16, 2003.

Jastrow, J.D., "Mean Residence Time of Soil Carbon Pools: Controlling Factors and Implications for Soil Carbon Cycling," 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 6, 2003.

Jastrow, J.D., O'Brien, S.L., Ullian, J.J., Van Til, B.E., and Swanston, C.W., "Soil Carbon Dynamics in Unprotected and Protected Pools. Task 4a: Process/Mechanistic-Based Fractionations, Results (to Date) for Year 0 Samples, Mineral Soil 0-15 cm Depth," EBIS Science Team Meeting, Irvine, California, January 28, 2003.

Jastrow, J.D., O'Brien, S.L., Van Til, B.E., Matamala, R., Swanston, C.W., and Hanson, P.J., "Incorporation of a Whole Ecosystem Radiocarbon Label into Unprotected and Protected Soil Carbon Pools," Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003.

Jastrow, J.D., O'Brien, S.L., Van Til, B.E., Matamala, R., Swanston, C.W., and Hanson, P.J., "Incorporation of a Whole Ecosystem Radiocarbon Label into Unprotected and Protected Soil Carbon Pools," North American Carbon Program Joint PI Meeting 2003, Arlington, Virginia, May 12-14, 2003.

Jastrow, J., O'Brien, S., Van Til, B., Matamala, R., Swanston, C., and Hanson, P., "Incorporation of a Whole Ecosystem Label into Unprotected and Protected Soil Carbon Pools," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Jastrow, J.D., Six, J., and Ullian, J.J., "Testing an Aggregate-Based Fractionation Technique to Detect Soil C Storage in Mineral-Associated Fractions," Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003.

Jastrow, J.D., Six, J., and Ullian, J.J., “Testing an Aggregate-Based Fractionation Technique to Detect Soil C Storage in Mineral-Associated Fractions,” North American Carbon Program Joint PI Meeting 2003, Arlington, Virginia, May 12-14, 2003.

Jastrow, J., Six, J., and Ullian, J., “Testing an Aggregate-Based Fractionation Technique to Detect Soil C Storage in Mineral-Associated Fractions,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Jastrow, J.D., Six, J., and Ullian, J.J., “Testing an Aggregate-Based Fractionation Technique to Detect Soil C Storage in Mineral-Associated Fractions,” Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 13, 2002.

Jones, L. (presented by D. Sisterson), “Tropical Western Pacific 2000,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Kelly, S.D., “U L3-Edge EXAFS at Environmentally Relevant Concentrations,” National Synchrotron Light Source Annual Users’ Meeting, Brookhaven National Laboratory, Upton, New York, May 19-21, 2003.

Kelly, S.D., “Basics of XAFS Data Processing,” EXAFS Data Collection and Analysis Workshop, Upton, New York, July 2003.

Kelly, S.D., Kemner, K.M., Brooks, S.C., Fredrickson, J.K., Kennedy, D.W., Zachara, J.M., Fendorf, S., Plymale, A., and Carroll, S.L., “Direct Evidence for Ca-UO₂-CO₃ Complexation,” 225th American Chemical Society National Meeting, New Orleans, Louisiana, March 2003.

Kelly, S., Kemner, K., O’Loughlin, E., Suzuki, Y., Banfield, J., Csencsits, R., and Cook, R., “Investigations of Biogeochemical Formation of Uranium Nanoparticles,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Kelly, S.D., Kemner, K.M., Brooks, S.C., Fredrickson, J.K., Carroll, S.L., Kennedy, D.W., Zachara, J.M., Plymale, A.E., and Fendorf, S., “Ca-UO₂-CO₃ Complexation — Implications for Bioremediation of U(VI),” XAFS 12, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003.

Kelly, S.D., Kemner, K.M., Watson, D., Jardine, P., and Phillips, D., “Uranium Coordination Environment at Site 3 of the NABIR Field Research Center,” NABIR FRC Workshop, Oak Ridge National Laboratory, Tennessee, September 2003.

Kemner, K.M., “A Review of Synchrotron-Based Environmental Research at MRCAT,” Program Evaluation Board Review, Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois, September 10, 2003.

Kemner, K.M., and Boyanov, M., “EMSI Collaborative Studies with the ER Division at Argonne,” Review of Environmental Molecular Science Institute, University of Notre Dame, Notre Dame, Indiana, September 24, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Cai, Z., Maser, J., Lai, B., Nealson, K.H., Kulpa, Jr., C.F., and Schneegurt, M., "Using High-Energy X-ray Physics to Address Environmental Science Problems," Physics Colloquium, Argonne National Laboratory, Argonne, Illinois, January 21, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Cai, Z., Maser, J., Lai, B., Nealson, K.H., Kulpa, Jr., C.F., and Schneegurt, M., "High Energy X-ray Investigations of Metal-Mineral-Microbe Interactions," University of Chicago Joint Statistical-Environmental Science Seminar Series, Chicago, Illinois, November 21, 2002.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Cai, Z., Maser, J., Lai, B., Suzuki, Y., and Banfield, J.F., "Uranium EXAFS Investigations of Metal-Mineral-Microbe Interactions," ASA-CSSA-SSSA Annual Meeting, Indianapolis, Indiana, November 11, 2002.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Cai, Z., Maser, J., Lai, B., Suzuki, Y., and Banfield, J.F., "High Energy X-ray Investigations of Metal-Mineral-Microbe Interactions," University of Delaware Plant and Soil Sciences Colloquium Series, Newark, Delaware, October 4, 2002.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Moe, L.A., Fox, B.G., Donnelly, M.I., and Giometti, C.S., "XRF and XAFS Analysis of Electrophoretically Isolated Non-Denatured Proteins," XAFS 12, 12th International Conference on X-ray Absorption Fine Structure, Malmo, Sweden, June 22-27, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Nealson, K.H., Lai, B., Maser, J., and Cai, Z., "Investigation of the Spatial Distributions and Concentrations of Biologically and Environmentally Relevant Elements at the Mineral-Microbe Interface," DOE-NABIR PI Workshop, Warrenton, Virginia, March 2003.

Kemner, K., Kelly, S., O'Loughlin, E., Nealson, K., Longer, Y., Schiffer, M., Lai, B., Maser, J., Cai, Z., Carpenter, E., and Harris, V., "Investigation of the Spatial Distribution and Concentrations of Biologically and Environmentally Relevant Elements at the Mineral-Microbe Interface," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Sholto-Douglas, D., Lai, B., Maser, J., DeCarlo, F., Mancini, D., Nealson, K., Banfield, J., Fein, J., and Walsh, B., "Beethoven, Metals, Minerals, and Microbes: The Use of Hard X-rays for Environmental Research," Joint Departments of Microbiology, Physics, and Biophysics Interdisciplinary Colloquium, University of Guelph, Guelph, Ontario, Canada, May 8, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Sholto-Douglas, D., Lai, B., Maser, J., Nealson, K., and Banfield, J., "Using Hard X-ray Absorption Spectroscopy and Nanoprobes for Investigating Nanoparticulates: Integrating Biochemistry and Materials Fabrication," Nanoscience Lunchtime Seminar Series, Argonne National Laboratory, Argonne, Illinois, May 14, 2003.

Kemner, K.M., Kelly, S.D., O'Loughlin, E.J., Sholto-Douglas, D., Lai, B., Maser, J., Cai, Z., and Nealson, K.H., "Hard X-ray Microprobe Investigations of the Distributions and Concentrations of Metals in Prokaryotes," Advanced Photon Source Users' Meeting, Argonne, Illinois, April 29, 2003.

Kim, Y.C., Donnelly, M., Collart, F., Dementieva, I., and Joachimiak, A., "The Midwest Center for Structural Genomics Approach to Automated Gene Cloning, Protein Expression, Purification, and Crystallization," Protein Structure Initiative: Protein Purification and Crystallization Workshop, National Institute of General Medical Sciences, Bethesda, Maryland, April 9-11, 2003.

Kotamarthi, V.R., "Development of TLM/Adjoint Photochemical Trajectory Model," Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting, American Meteorological Society, Long Beach, California, February 11, 2003.

Kotamarthi, V.R., "Effect of Fast Chemical Reactions on Vertical Mass Flux Variations above Vegetation," Annual Atmospheric Science Program Meeting, U.S. Department of Energy, Orlando, Florida, March 4, 2003.

Kotamarthi, V.R., "Effect of Fast Chemistry on Measured Surface Fluxes of Trace Atmospheric Gases," 35th Great Lakes Regional Meeting, American Chemical Society, Chicago, Illinois, May 31, 2003.

Kotamarthi, V.R., "Process Scale Modeling of Atmospheric Chemistry on Urban and Regional Scales," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Lesht, B., Hawley, N., and Schwab, D., "Cross-Shore Variations in Wave Forcing and Bottom Sediment Response in Southeastern Lake Michigan," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Lesht, B.M., Hawley, N., and Stroud, J.R., "Sensitivity Analysis of a Zero-Dimensional Sediment Resuspension Model," 46th Annual International Association for Great Lakes Research Conference, Chicago, Illinois, June 25, 2003.

Lesht, B.M., Leshkevich, G.A., Stroud, J.R., Schwab, D.J., and Stein, M.L., "Application of Satellite Observations of Water Color to Study of the Great Lakes," 46th Annual International Association for Great Lakes Research Conference, Chicago, Illinois, June 24, 2003.

Liljegren, J.C., "Improved Retrievals of Liquid Water Path Using a Twelve-Channel Microwave Radiometer," Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Liljegren, J. (presented by D. Sisterson), "Improved Retrievals of Liquid Water Path Using a Twelve-Channel Microwave Radiometer," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Liljegren, J.C., “Improved Retrievals of Temperature and Water Vapor Profiles Using a Twelve-Channel Microwave Radiometer,” Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Liljegren, J. (presented by D. Sisterson), “Improved Retrievals of Temperature and Water Vapor Profiles Using a Twelve-Channel Microwave Radiometer,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Liljegren, J.C., “The DOE/ARM SGP User Facility,” 87th Range Commander Council — Meteorology Group Meeting, Reagan Test Site, U.S. Air Force (USASMDC/USAKA/RTS), Tulsa, Oklahoma, June 24, 2003.

Liljegren, J., Sisterson, D., and Teske, J., “Long-Term Analysis of the Corrective Maintenance of the ARM SGP CART,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Lin, Y.J., Arora, M.B., Hestekin, J.A., St. Martin, E.J., Donnelly, M.I., and Snyder, S.W., “A Separative Bioreactor: Direct Product Capture and pH Control,” 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 4-7, 2003.

Machesky, M.L., Ridley, M.K., Wesolowski, D.J., Palmer, D.A., Zhang, Z., Fenter, P., and Sturchio, N.C., “The Utility of *In Situ* X-ray Standing Wave Measurements to Help Constrain Surface Complexation Models,” American Geophysical Union National Meeting, San Francisco, California, December 6, 2002.

Marley, N.A., and Gaffney, J.S., “Air Quality Measurements in Phoenix, Arizona,” Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 9-13, 2003.

Marley, N.A., and Gaffney, J.S., “Measurements of Natural Radioactivity in Submicron Aerosols in the Pittsburgh Area,” American Geophysical Union 2002 Fall Meeting on Atmospheric Science, EPA PM Supersite Program: Results and Findings from the Summer 2001 Field Intensive, San Francisco, California, December 6, 2002.

Marley, N.A., and Gaffney, J.S., “Nancy’s Global Change Hot Topic — 2003: The Fish vs. the Farmers in the Oregon River Systems,” Global Change Education Program Orientation, Portland, Oregon, June 10, 2003.

Marley, N.A., and Gaffney, J.S., “Update on Fast GC/Luminol System for NO₂ and PAN Measurements,” DOE-Atmospheric Science Program Review Meeting, Orlando, Florida, March 4, 2003.

Marley, N.A., Gaffney, J.S., Gunter, R.L., and Luke, W.T., “New Improved Fast GC-Luminol Instrument for PAN and Nitrogen Dioxide Measurements,” Fifth Conference on Atmospheric Chemistry, 83rd Annual Meeting of the American Meteorological Society, Long Beach, California, February 9-13, 2003.

Matamala, R., Jastrow, J.D., Amthor, J.S., Garten, C.T., and Miller, R.M., "Increasing Soil Carbon and Nitrogen Stocks under Restored Tallgrass Prairie: Influence of Soil Type," Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 14, 2002.

Matamala, R., Jastrow, J.D., and Gonzalez-Meler, M.A., "Soil Carbon Cycling and Storage in a Restored Tallgrass Prairie Chronosequence," North American Carbon Program Joint PI Meeting 2003, Arlington, Virginia, May 12-14, 2003.

Matamala, R., Smith, E., Jastrow, J., and Gonzalez-Meler, M., "Soil Carbon Stocks and Soil Respiration on a Restored Tallgrass Prairie Chronosequence," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Matamala, R., Smith, E., Jastrow, J., Miller, R.M., and Gonzalez-Meler, M., "The Use of Stable Isotopes to Study Carbon Cycling in a Restored Tallgrass Prairie Chronosequence," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

McCarthy, J.F., Perfect, E., Jastrow, J.D., and Ilavsky, J., "Determining the Morphology of Soil Microaggregates Using SAXS," North American Carbon Program Joint PI Meeting 2003, Arlington, Virginia, May 12-14, 2003.

Millard, C.S., Stols, L., Quartey, P., Kim, Y., Dementieva, I., and Donnelly, M.I., "Two-Liter Plastic Bottles as Disposable Culture Vessels for the Production of Recombinant Proteins in *Escherichia coli*," Society of Industrial Microbiology Annual Meeting, Minneapolis, Minnesota, August 10-14, 2003.

Miller, R.M., "Arbuscular Mycorrhizal Fungi Influence Soil Structure," International Workshop on Soil-Plant Interactions, Beijing, China, October 27-30, 2002.

Miller, R.M., "Commentary on 'A Role for Genetically Modified Organisms in Soil Carbon Sequestration,'" Applications of Biotechnology to Mitigation of Greenhouse Warming, St. Michaels Workshop, St. Michaels, Maryland, April 13-15, 2003.

Miller, R.M., "The Contributions of Arbuscular Mycorrhizal Fungi to Sustainable Development," Indo-US Workshop and National Congress on Molecular Biology and Biotechnological Symbiosis, New Delhi, India, March 23-28, 2003.

Miller, R.M., "The Function of Mycorrhizal Fungi in Soil Restoration, International Workshop on Microbial Function in Revegetation Process of Degraded Terrestrial Environments: From Gene through to Ecosystem," University of Tokyo, Tokyo, Japan, November 29, 2002.

Miller, R.M., "The Function of Mycorrhizal Fungi in Soil Restoration," Japanese Conference on Mycorrhizae, Nagoya University, Nagoya, Japan, November 30, 2002.

Miller, R.M., "The Importance of the Mycorrhizal Symbiosis to Global Climate Change," Indo-US Workshop and National Congress on Molecular Biology and Biotechnological Symbiosis, New Delhi, India, March 23-28, 2003.

Miller, R.M., "The State of Belowground Research at FACE Sites," The Eco-environmental Sciences Section, Bio-Oriented Technology Research Advancement Institution, Toranomon, Japan, November 28, 2002.

Miller, R.M., Chaudhary, V., Gades, L., Jastrow, J.D., Kirt, S., Matamala, R., and Skogen, K.A., "Is There a Mycorrhizal Fungal Response to CO₂ Fumigation in the Field?" Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003.

Miller, R.M., Wright, S.F., and Jastrow, J.D., "Glomalin Contributions to Soil Carbon and Nitrogen Pools in a Prairie Reconstruction," Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 13, 2002.

Nissen, T.M., Rodriguez, V.V., Matamala, R., Jastrow, J.D., and Wander, M.M., "Sampling Soybean Roots: A Comparison of Excavation and Coring Methods," Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 11, 2002.

O'Brien, S.L., Jastrow, J.D., Pregitzer, K.S., and Zak, D.R., "Effect of Soil Fertility on Physically Fractionated Soil C and N Pools of Sandy Soils Exposed to Elevated Atmospheric CO₂," Soil Ecology Society Ninth Biannual International Conference, Palm Springs, California, May 11-14, 2003.

O'Brien, S.L., Jastrow, J.D., Pregitzer, K.S., and Zak, D.R., "Effect of Soil Fertility on Physically Fractionated Soil C and N Pools of Sandy Soils Exposed to Elevated Atmospheric CO₂," Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 13, 2002.

O'Loughlin, E.J., "Synchrotron Environmental Science," LDRD Mini Symposium, Argonne National Laboratory, Argonne, Illinois, April 7, 2003.

O'Loughlin, E., Kelly, S., Kemner, K., and Burris, D., "XAFS Study of the Catalytic Effects of Ag, Au, and Cu on the Reductive Dechlorination of Carbon Tetrachloride by Green Rust," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Park, C., Fenter, P., Sturchio, N.C., Zhang, Z., Cheng, L., and Orlandini, K., "X-ray Reflectivity Study of the Fluorapatite (100)-Water Interface," 13th Goldschmidt Conference, Kurashiki, Japan, September 9, 2003.

Park, C., Fenter, P., Zhang, Z., Cheng, L., and Sturchio, N.C., "Structure of the Fluorapatite (100)-Water Interface by High Resolution X-ray Reflectivity," American Geophysical Union National Meeting, San Francisco, California, December 6, 2002.

Park, C., Zhang, Z., Cheng, L., Fenter, P., and Sturchio, N., "Structure of Fluorapatite (100)-Water Interface by High-Resolution X-ray Reflectivity," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Pekour, M., Cook, D., Ritsche, M., Kotamarthi, V.R., Doskey, P.V., Jobson, B.T., and Hubbe, J., “Measuring Trace Gas Fluxes from an Aircraft Platform,” Annual Atmospheric Science Program Meeting, U.S. Department of Energy, Orlando, Florida, March 4, 2003.

Pekour, M., Cook, D., Ritsche, M., Kotamarthi, V.R., Doskey, P.V., Jobson, B.T., and Hubbe, J., “Measuring Trace Gas Fluxes from an Aircraft Platform,” EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Peppler, R.A., Bond, D., Dean, A., Sonntag, K., Bahrmann, C.P., Richardson, S., Choudhari, C., Doty, K.J., Stampf, D., Wagener, R., Cook, D.R., McCord, R.A., and Palanisamy, G., “The Data Quality Reporter System,” Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Petracca, B., Church, H., Zak, B.D., Storvold, R., and Lesht, B.M., “Analysis of Selected Radiosonde Data from the ARM/NSA Site,” Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Post, W.M., Izaurralde, R.C., and Jastrow, J.D., “Integrated Analysis of Soil Carbon Sequestration Enhancement Methods,” Uniting Sciences: Solutions for the Global Community, 2002 Annual Meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Indianapolis, Indiana, November 12, 2002.

Price, H.U., Jaffe, D.A., Doskey, P.V., and Jaegle, L., “Determination of OH during Trans-Pacific Transport of Pollutants Using NMHC Ratios and Backward Trajectories: Role of Heterogeneous Chemistry,” 2002 Fall Meeting of the American Geophysical Union, San Francisco, California, December 6-10, 2002.

Schmeling, M., Fosco, T., Doskey, P., Kotamarthi, V., Ochsner, H., and Harris, L., “Characterization of Airborne Particulate Matter during the Land-Lake Breeze Effect Study in Chicago, IL,” 35th Great Lakes Regional Meeting, American Chemical Society, Chicago, Illinois, June 1, 2003.

Sisterson, D.L., “A Fun Approach to Thinking and Problem Solving,” Day Science Conference, DuPage County Institute, Regional Office of Education, Glen Ellyn, Illinois, February 28, 2003.

Sisterson, D.L., “ARM CART Performance Assessment,” Atmospheric Radiation Measurement North Slope of Alaska Operations Meeting, U.S. Department of Energy, Albuquerque, New Mexico, November 19, 2002.

Sisterson, D.L., “ARM CART Performance Assessment,” Atmospheric Radiation Measurement Tropical Western Pacific Operations Meeting, U.S. Department of Energy, Los Alamos, New Mexico, November 20, 2002.

Sisterson, D.L., “Climate Change Research,” Rotary Club Meeting, Woodridge, Illinois, January 21, 2003.

Sisterson, D.L., “How Real Science Is Done,” Gifted Science Teacher Certification Program in Illinois, Argonne National Laboratory, Argonne, Illinois, May 23, 2003.

Sisterson, D.L., "Instrument Health, Operations, Data Processing, and Data Quality," Atmospheric Radiation Measurement Cloud Properties Working Group Meeting, U.S. Department of Energy, Broomfield, Colorado, November 13, 2002.

Sisterson, D.L., "Operations Performance Measures Expectations," Atmospheric Radiation Measurement CART Site Operations Meeting, U.S. Department of Energy, Argonne National Laboratory, Argonne, Illinois, January 23, 2003.

Sisterson, D.L., "Operations Roles and Responsibilities," Atmospheric Radiation Measurement CART Site Operations Meeting, U.S. Department of Energy, Argonne National Laboratory, Argonne, Illinois, January 22, 2003.

Sisterson, D.L., "Overview of Atmospheric Radiation Measurements Operations Assessment Plans, Coordination and Communication of Quantitative Assessment Plans between ARM Operations and ARM Data Quality," U.S. Department of Energy, Norman, Oklahoma, February 19, 2003.

Sisterson, D.L., "Southern Great Plains Cloud and Radiation Testbed Site," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Sisterson, D.L., "Tornadoes and the Scientific Method," Elmhurst School District Science Class Presentations, Churchville Middle School, Elmhurst, Illinois, March 4 and 7, 2003.

Sisterson, D.L., "Tornadoes and the Scientific Method," Orland Park School District Science Class Presentations, Jerling Junior High School, Orland Park, Illinois, March 20, 2003.

Sisterson, D.L., "What Scientists Do," Willow Springs Lion's Club, Willow Springs, Illinois, September 17, 2003.

Sisterson, D.L., Howedel, B., Jones, L., Kornke, W., Liljegren, J., McCord, R., Peppler, R., Perkins, B., Teske, J., Zak, B., and Zirzow, J., "Quantitative Assessment of Data Availability for ARM CART," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Sisterson, D.L., Jones, L., Kornke, W., Liljegren, J.C., McCord, R., Peppler, R., Teske, J.J., Zak, B., and Zirzow, J., "Quantitative Performance Assessment of Data Availability for ARM CART," Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Smith, E.A., Gonzalez-Meler, M.A., Matamala, R., Jastrow, J.D., and Miller, R.M., "Carbon Dynamics of a Restored Tallgrass Prairie Chronosequence Assessed with Stable Isotopes," 88th Annual Meeting of the Ecological Society of America, Savannah, Georgia, August 3-8, 2003.

St. Martin, E.J., Lin, Y.J., Hestekin, J.A., Arora, M.B., Millard, C.S., Snyder, S.W., and Donnelly, M.I., "Production of Lactic Acid in a pH-Controlled Separative Bioreactor," 25th Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, Colorado, May 4-7, 2003.

Sultan, M., Becker, R., Jastrow, J.D., Miller, R.M., Kim, J., and El Alfy, Z., "Land Cover and Land Use Changes and Their Impacts on Groundwater Resources and Carbon Cycling in Southwestern Egypt," Fall Meeting of the American Geophysical Union, San Francisco, California, December 6-10, 2002.

Sutton, S., and Kemner, K.M., "Advancement of Environmental Remediation Science Research at the Advanced Photon Source," Environmental Remediation Sciences Division Meeting, U.S. Department of Energy, Germantown, Maryland, June 2003.

Tobin, D., Revercomb, H., Feltz, W., Knuteson, R., Turner, D., Lesht, B., Strow, L., Barnett, C., and Fetzer, E., "ARM Site Atmospheric State Best Estimates for AIRS Validation," Thirteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, Broomfield, Colorado, April 1, 2003.

Wesolowski, D.J., Machesky, M.L., Zhang, Z., Benezeth, P., Fenter, P., and Sturchio, N.C., "Sorption of Zn(II) and Co(II) on Rutile Surfaces from 25 to 250 Degrees Centigrade by pH Titrations: Impact of X-ray Standing Wave (XSW and EXAFS) Studies on Electrical Double Layer Models," American Geophysical Union National Meeting, San Francisco, California, December 6, 2002.

Yan, Y.E., Kolm, K., Meyer, W.T., and LaFreniere, L.M., "Characterizing and Modeling the Impacted Upper Silver Creek Hydrologic System, Utah, Using a Watershed-Based, Integrated Approach," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Zak, B. (presented by D. Sisterson), "North Slope of Alaska Update 2001," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Zaveri, R.A., Berkowitz, C.M., Kleinman, L.I., Springston, S.R., Doskey, P.V., and Spicer, C.W., "Evaluation of Ozone Production Efficiency in an Urban Plume Using a Lagrangian Box Model," 2002 Fall Meeting of the American Geophysical Union, San Francisco, California, December 6-10, 2002.

Zhang, Z., Fenter, P., Cheng, L., Sturchio, N.C., and Bedzyk, M.J., "Atomic-Scale X-ray Analysis of Ion Adsorption at the Rutile-Water Interface," 226th National Meeting of the American Chemical Society, New York, New York, September 7-11, 2003.

Zhang, Z., Fenter, P., Cheng, L., Sturchio, N., Bedzyk, M., Machesky, M., Anovitz, L., and Wesolowski, D., "Probing Condensed Layer Ion Positions at the Rutile-Water Interface with High-Brilliance X-rays," EEST 2003, Argonne National Laboratory, Argonne, Illinois, June 13, 2003.

Zhang, Z., Fenter, P., Cheng, L., Sturchio, N.C., Park, C., Bedzyk, M.J., Machesky, M.L., Anovitz, L.M., and Wesolowski, D.J., "Condensed Layer Ion Positions at the Rutile (110)-Water Interface with High Brilliance X-rays," American Geophysical Union National Meeting, San Francisco, California, December 6, 2002.

7. Patents Issued

Donnelly, M.I., Eschenfeldt, W.H., and Trent, J.T., "Novel 2,5-Diketo-D-Gluconic Acid Reductases and Methods of Use," 6,576,452, June 2003.